

Claims:

1 1. A network device that communicates with other network
2 devices connected through a network, wherein:
3 said network device comprising:
4 a group management means, which manages a group
5 consisting of network devices that can authenticate one another;
6 a cipher communication means, which performs cipher
7 communication with the network devices belonging to said group,
8 using a common encryption key;
9 a storage means, which stores cipher communication
10 information required for cipher communication with the network
11 devices belonging to said network, with said information including
12 information of said encryption key and identification information
13 including host names and addresses of the network devices
14 belonging to said group; and
15 an acquisition means, which acquires information from
16 outside; and
17 when said acquisition means acquires said cipher
18 communication information in a state that said storing means
19 does not store said cipher communication information, said group
20 management means stores said cipher communication information
21 in said storing means and sends identification information of its
22 own network device to the network devices belonging to said
23 group; and
24 when said group management means acquires
25 identification information of another network device from said

26 another network device through said cipher communication means,
27 said group management means adds said identification
28 information to said cipher communication information stored in
29 said storage means.

1 2. A network device according to Claim 1, wherein:
2 when said acquisition means receives an instruction to
3 withdraw from the group, said group management means notifies
4 withdrawal of its own network device to all the network devices
5 belonging to said group through said cipher communication means,
6 and deletes said cipher communication information from said
7 storing means; and
8 when a notification of withdrawal of another network
9 device is received from said another network device through said
10 cipher communication means, said group management means
11 deletes identification information of said another network device
12 from said cipher communication information stored in said storing
13 means.

1 3. A network device according to Claim 1 or Claim 2,
2 wherein:
3 said acquisition means is an interface with a storage
4 medium; and
5 when a storage medium, which stores said cipher
6 communication information, is inserted into said acquisition
7 means in a state that said storage medium stores said cipher
8 communication information, said group management means copies
9 the cipher communication information stored in said storage

10 means to said storage medium.

1 4. A network device according to one of Claims 1, 2 and 3,
2 wherein:

3 said network device further comprises:

4 a non-cipher communication means, which performs
5 non-cipher communication; and

6 an access control means, which controls accesses to
7 services provided by said network device; and

8 when there occurs an access from another network device
9 through said non-cipher communication means, said access control
10 means permits said access when said access is an access to a
11 predetermined port.

1 5. A network system comprising a plurality of network
2 devices, and a network that connects said plurality of network
3 devices, wherein:

4 each of said plurality of network devices is a network
5 device according to one of Claims 1 - 4.

1 6. A group management method for managing a group
2 consisting of devices connected through a network, with a device
3 of the group being able to perform cipher communication with
4 another device of the group while authenticating each other,
5 comprising:

6 a group generation step, in which one device connected to
7 said network generates an encryption key used for said cipher
8 communication, and holds, as cipher communication information,

9 said encryption key and identification information including a
10 host name and address of said one device itself;

11 a first group participation step, in which a device that
12 acquires said cipher communication information notifies
13 identification information of the device itself and information
14 indicating participation of the device itself to all devices whose
15 identification information is stored in said cipher communication
16 information, and said device adds said identification information
17 of the device itself to said cipher communication information and
18 holds said cipher communication information;

19 a second group participation step, in which a device that
20 receives said identification information and said information
21 indicating the participation adds said identification information
22 to the cipher communication information that said device holds;

23 a first withdrawal step, in which a device that receives an
24 instruction to withdraw from said group notifies information
25 indicating withdrawal and identification information of the device
26 itself to all devices excluding said device itself whose
27 identification information is stored in said cipher communication
28 information, and deletes the cipher communication information
29 that the device itself holds; and

30 a second withdrawal step, in which a device that receives
31 the notification of said withdrawal deletes the notified
32 identification information from the cipher communication
33 information that the device itself holds.

7. A program that makes a computer function as:

a group generation means that generates an encryption

key used for cipher communication and holds, as cipher communication information, said encryption key and identification including a host name and address of the computer itself;

a first group participation means that notifies identification information and information indicating participation of the computer itself to all devices whose identification information is stored in said cipher communication information, through cipher communication, and adds the identification information of the computer itself to said cipher communication information, when said cipher communication information is acquired;

a second group participation means that adds said identification information of another device to the cipher communication information that the computer itself holds, when said identification information of said another device and information indicating participation of said another device are received from said another device;

a first group withdrawal means that notifies information indicating withdrawal and identification information of the computer itself to all devices excluding the computer itself whose identification information is stored in the cipher communication, through the cipher communication, and deletes said cipher communication information that the computer itself holds, when an instruction to delete the cipher communication information is received; and

a second group withdrawal means that deletes identification information of another device from the cipher

communication information that the computer itself holds, when said identification information of said another device and information indicating withdrawal of said another device are received.